

The bumper case 14 functions as a holding member in handling of the semiconductor device 35, and also functions as a bumper to protect the semiconductor element 1' from external force and impact similarly to the embodiment 4. Moreover, the bumper case 14 protects a side of the element 1' in this embodiment, thus improving reliability of the semiconductor device 35. As shown in Fig. 17D, the semiconductor device 35 is then inverted and subjected to a taping process. Thus, the device 35 can be mounted by an electronic component mounting apparatus.

With referring to Fig. 18A and Fig. 18B, mounting the semiconductor device 35 will be described. As shown in Fig. 18A, the device 35, having a top surface of bumper case 14 sucked and held by a mounting head 10, is positioned above the substrate 11 by the head 10. In the present embodiment, an adhesive 16 is previously applied to a region (which corresponds to the projection 14a of the bumper case 14) surrounding electrodes 12 on a top surface of the substrate 11. With aligning the bumps 2 of the device 35 with respective electrodes 12 of the substrate 11, head 10 is then lowered to mount the bumps 2 of the semiconductor element 1' on the electrodes 12.

Thus, the projection 14a of the bumper case 14 contacts with the adhesive 16 on the substrate 11. Subsequently, the substrate 11, upon being heated, has respective electrodes 12 bonded to the bumps 2 by soldering as shown in Fig. 18B, and thus, the bumper case 14 is secured to the substrate 11 by the adhesive 16. As described above, even in this embodiment, the mounting head 10 holds the bumper case 14, which is the holding member, during the handling of the semiconductor device 35.

In an assembly including the semiconductor device 35 mounted on substrate 11, the device 35 is fixed to the substrate 11 through the bonding of bumps 2 as electrodes of device 35 to respective electrodes 12 of the substrate

11 as a workpiece, and through the bonding of a border of the bumper case 14 to the substrate 11. Even in this assembly, the semiconductor element 1' can be deformed, and the same advantage as that of the semiconductor element described in the embodiment 4 is obtained.

- 5        Further, as shown in Fig. 18B, the semiconductor element 1' of the semiconductor device 35 has a top surface and border entirely sealed after being mounted in the present embodiment. Therefore, the device is protected from moisture and extraneous matter entering junctions of the device 35 and electrodes 12, and thus has an improved reliability after the mounting.

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